40/W.O./6966.

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HANDBOOK

OF THE

M.L. STOKES 3-INCH TRENCH MORTAR EQUIPMENTS.

LAND SERVICE, 1919.

LONDON:
PUBLISHED BY HIS MAJESTY'S STATIONERY OFFICE.

To be purchased through any Bookseller or directly from
H.M. STATIONERY OFFICE at the following addresses:
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NOTE.—This book is corrected up to December, 1919. Any alterations which may be suggested should be forwarded direct to the Chief Inspector of Armaments, Inspection Department, Royal Arsenal, Woolwich.

HANDBOOK OF THE M.L. STOKES 3-INCH TRENCH MORTAR EQUIPMENTS.

LAND SERVICE.

PARTICULARS.

Material	Steel.
Weight (approximate)	44-lbs.
Length, total	48-inches.
Bore { length (from muzzle to front end of striker stud)	45-inches, (approximate).
Bore { diameter	3-inches.
Firing	Percussion.

MORTAR.

(*Plates VII to X.*)

The mortar consists principally of a steel barrel, breech piece with washer and striker stud, stop bolt, elevating band with securing band and stop collar.

The *barrel* is of steel tube slightly reduced in section from the breech towards the muzzle and reduced in diameter at the breech end for the reception of the breech piece.

The *breech piece* is screwed over the rear end of the barrel and is furnished with a striker stud screwed into the breech piece and projecting axially into the bore. The outer end of the breech piece is formed semi-spherical to suit the socket of the base plate and is provided with a hole in the lower end for use with a tommy when assembling and dismantling.

A *bomb stop* is provided on the left side of the barrel near the muzzle, and consists of a stop bolt, the inner end of the bolt projecting through the barrel into the bore when in the loading position. The bolt is held in a socket which is screwed into the barrel and secured by a lock-nut. A loop for lanyard is hinged at the outer end of the bolt.

The *elevating band* is clamped round the barrel near the muzzle by means of a securing band with two nuts. The bands are prevented from moving by stop screws. The underside of the elevating band forms a nut for the traversing screw in the crosshead of the stand.

The *stop collar* is of steel and is intended to be clamped round the barrel in front of the elevating band, so as to prevent longitudinal movement of the latter before firing.

It consists of a split steel ring and clamping collar, the former having serrations prepared on the exterior surface and the latter being slightly tapered with screw thread for screwing over the split ring. A hole is provided in the exterior of the clamping collar for the reception of the stud on the stop collar wrench "A." The split ring being held by a wrench "B" while the collar is rotated in assembling.

Base Plates.

The *Mark II* base plate (*Plate IV*) consists of an octagonal steel plate having a flanged socket for the reception of the rounded end of the breech piece riveted to the upper side. Two rope handles for transporting purposes are attached by steel loops to the upper side of the plate. Holes to admit of the use of spikes for securing the base plate in position are provided at the corners.

The *Mark III* base plate (*Plate V*) consists of a steel stamping in the form of a shallow rectangular tray, 20-inches long by 13-inches wide, the centre of which is reinforced by a stiffening plate. Three cupped recesses are formed on its longitudinal axis for the reception of the rounded end of the breech piece of the mortar, the latter being prevented from rearward movement by an angle steel stop. The base plate is provided with a rope handle for lifting purposes.

Stands.

(*Plates II and III.*)

The *Mark II* stand consists principally of deflection, elevating and traversing gears, supported on a tubular bipod stand with cross stay.

The legs of the stand are left and right and are made of steel tube, each with spiked foot, cross stay lug and fork end brazed on. The legs are connected near the centre by means of a hinged cross stay and at the upper ends by two trunnion studs to a trunnion standard which carries the elevating wheel and pinion, elevating handle and gear box. The elevating screw passes through the centre of the elevating wheel, which forms a nut for the screw, and is prepared at the upper end with a coned portion, with nut and washer, for connecting to the traversing crosshead.

The traversing crosshead is attached to the upper end of the elevating screw and carries the traversing handle and traversing screw, which latter works in a nut formed in the underside of the elevating band on the barrel.

The deflection gear consists principally of a supporting bracket, spindle and pointer.

The supporting bracket is secured in a horizontal position in front of the traversing crosshead by means of the nut on top of the elevating screw and carries a brass tubular spindle.

The spindle has, inscribed longitudinally round its surface, eight deflection scales which are graduated to suit angles of elevation (at 5° interval) between 45° and 80°, and are arranged to read "right" and "left" from zero, the right graduations being in red and the left in black. It is rotated by means of a knurled head until the required scale is exposed to view through an opening formed in the supporting bracket.

The pointer, by means of which the scales are read, is attached to the base portion of the traversing band by a spring clip.

The deflection, elevating and traversing gears are worked from the left side of the mortar.

A bronze ring engraved with the nature and mark of the stand is attached round one of the legs.

The *Mark I* stand differs from the *Mark II* tubular stand in being made of lighter tubing and in having no bronze marking ring round one of the legs.

These stands will be considered obsolete as they are replaced by the *Mark II* tubular stands.

SHIELD, M.L. STOKES 3-INCH TRENCH MORTAR.

(*Plate VI.*)

The shield is made of steel plate, No. 5. S.W.G. (·212-inch) thick, and consists principally of one centre, one movable and three wing portions, the third wing portion being used to extend the shield to the left in order the better to protect the number operating the elevating, traversing and deflection gears.

The *centre portion* is rectangular in shape and is provided with two hinge bolt and catch plates for the attachment of the wing portions

The *wing portions*, which are in all respects similar, are rectangular in shape and have their upper edges scalloped for use in adjusting the height of the movable portion to suit the angle of elevation of the mortar. Each wing portion is provided with three hinge bolt and catch plates, an eye supporting stay and stay for supporting the shield when in use. The stay has, pivoted near its foot, a stop to prevent undue sinking in the ground and is hinged about its centre to facilitate transport, a steel loop being provided for locking the two portions together when in use. When not in use the stay is folded up and housed by a steel spring clip.

The *movable portion* is cut away on its upper edge in order to clear the mortar and is hung in front of the shield over the centre portion by means of two supporting hooks which engage the scallops in the upper edges of the wing portions.

MOUNTING, ANTI-AIRCRAFT, M.L. STOKES 3-INCH TRENCH MORTAR.

(*Plates VII to X.*)

The anti-aircraft mounting consists principally of a frame constructed of 1-inch by ¼-inch flat steel bar provided at the top with a pair of hardwood handles, mounted on a pair of legs which being connected near the bottom by a curved cross stay, forms a bipod stand.

The central portion of the mounting is formed for the reception of the barrel; the latter is held in position by a clamping band with two clamping screws each of which is provided with a small securing chain attached to an eye riveted in the side of the frame.

The stand is hinged to the frame portion to which it is held rigid, when in use, by a locking pin with securing chain, when not in use the stand is folded back against the barrel and secured by a leather

strap. A steel pillar for the reception of the mirror sight is provided, centrally at the top of the mounting.

The approximate dimensions are as under :—

Height, overall (including pillar supporting sight)	41·0-inches.
Width, maximum, over handles ..	21·0-inches.

PLATE, BASE.

(*Plates VII to IX.*)

The base plate for use with the Anti-Aircraft Mounting is of steel, rectangular on plan; it is provided centrally on its upper surface with a raised cup for the reception of the breech end of the barrel, re-inforced on its underside by steel angles, and furnished with a rope handle for transporting purposes.

STRAP, TRANSPORTING, M.L. STOKES 3-INCH TRENCH MORTAR.

(For Anti-Aircraft equipments.)

(*Plate X.*)

The transporting strap is made of 2-inch canvas webbing, in two parts, connected about the centre by a buckle with two running loops of leather. The muzzle end portion of the strap is furnished with a leather cross strap for attachment round the muzzle, the breech end being provided with a steel spring loop, fitted with a clamping screw with keep ring, for attachment to the breech end of the barrel.

SIGHTING.

(*Plate XI.*)

SIGHT, OPEN, M.L. STOKES 3-INCH TRENCH MORTAR, MARK I.

The sight is so designed, that it can be rested on the muzzle of the mortar during the operation of laying, and the line of fire picked up by the layer, by fixing the bar sight by hand in any position in the vertical plane, so as to enable him to align the sights on any object or auxiliary mark.

The body of the sight is shaped to rest on the muzzle of the mortar and is provided with a fork to carry the bar sight. The bar sight is provided with a fore and hind sight and is held in the fork by a clamping bolt and nut, sufficiently tight to permit of the bar being moved up or down by hand. The bar can be clamped in any position by means of a milled head.

An adjustable spirit level, on the top side of the body, enables the layer to cross-level the sight as required.

SIGHT, MIRROR, A.A., M.L. STOKES 3-INCH TRENCH MORTAR, MARK I.

The mirror sight which is for use against aircraft consists of a five-sided base block of hard wood, the underside of which is bored and provided with a gun metal socket for the reception of the sight supporting pillar on the clamping frame. A feather way is formed in the socket for a feather on the supporting pillar, which prevents

the sight from turning, and the sight is locked by means of a locking piece secured to the socket.

The upper and lower forward faces of the base are provided with mirrors, the latter are bedded in the base and secured by a frame and wood screws. A clock dial is engraved on the mirrors, with the XII point to the front and over the axis of the mortar. The figures on the dial are engraved in the opposite direction to the ordinary clock, *i.e.*, the figure I is on the left of XII.

A sight bar, attached to the base is shaped to allow the layer to look down into the mirrors. The bar is provided with two sighting holes, one for use when engaging approaching machines, the other for machines moving away.

NOMENCLATURE OF EQUIPMENT.

The nomenclature of the mortar, base plates, stand, shield, mounting, A.A., and separate demandable stores is as follows :—

		No.
Ordnance, M.L. Stokes 3-inch trench mortar, Mark I :—		
Barrel ..	Steel; with breech piece, washer and striker stud; elevating band with securing band and 2 nuts; stop collar, consisting of split ring and clamping collar; stop bolt socket; socket locking nut; stop bolt; and stop bolt withdrawing loop with axis rivet	1
Plate, base, Mark II	Steel, with socket with rivets, 4 loops and 2 rope handles	1
or Mark III	Steel, with rope handle	
Stand, Mark II	Steel, tubular; consisting of left and right legs, each with spiked foot, cross stay lug, cross stay bolt with nut, and fork end; cross stay in 2 parts (I) and (II with connection), and hinge bolt with nut; trunnion standard with elevating pinion stud with keep pin and nut and keep pin; 2 trunnion studs each with keep pin, and gear cover with 3 securing screws; elevating wheel; elevating pinion; elevating handle; elevating screw with nut and washer; traversing crosshead; traversing screw; traversing screw shaft with coupling securing wire and traversing handle with pin; and locking pin for traversing screw shaft with S-hook and spring; pointer; bracket with deflection tube, with knurled head with split keep pin and spring washer	1
Shield, M.L. 3-inch Stokes Trench Mortars	Steel; in five parts	1

		No.
Mounting, anti-aircraft M.L. Stokes 3-inch Trench Mortar, Mark II	Consisting of stand and clamp with mirror sight pillar	1
Mounting, anti-aircraft, M.L. 3-inch Stokes trench mortar—Plate, base Mark I ..	Steel, with rope handle	1
Cover, muzzle, M.L. 3-inch Stokes Trench Mortar, Mark I .. or Mark II ..	Waterproof canvas; with wire ring, chain and loop, and securing cord .. .. .. / Leather; with securing cord	1
Straps, transporting, M.L. 3-inch Stokes Trench Mortar, Mark I ..	Consisting of canvas shoulder strap, leather sling strap with breech loop, and leather barrel strap	1
Tommy, M.L. 3-inch Stokes Trench Mortar, Mark I ..	Steel	1
Wrenches, Stop Collar, 3-inch Stokes Trench Mortar "A" ..	Steel; with riveted stud	1
"B" ..	" " " "	1

CARE AND PRESERVATION.

(These instructions apply also to the A.A. Equipment except where reference is made to the elevating and traversing gears and shield.)

The mortar should be kept clean and free from rust and débris, the bore slightly greased and the stop bolt and releasing trigger well lubricated.

If the mortar is not to be used for some time, the bore should be cleaned and oiled with paraffin or mineral oil. Thick lubricating oil should not be used for this purpose as it chars and tends to clog the bore. Should the bore become "sticky" the surface should be cleaned with paraffin or petrol.

The striker stud should be examined from time to time, the breech piece being removed from the barrel for this purpose by means of the tommy provided. If found to be worn so as to be likely to cause miss-fires it should be replaced by a new striker stud, care being taken that the striker stud and the breech piece are tightly screwed home on replacement.

The muzzle cover should be kept in position on the muzzle when the mortar is not being used. In wet weather this is of special importance, as water in the bore seriously affects the range.

The recess for rear end of breech piece in the base plate should be kept free from earth.

The stand should be kept clean and all working parts, *e.g.*, the elevating and traversing gears, well lubricated. It is important that the nuts on the securing band of the elevating band should be tightened up from time to time, as they tend to work loose after continuous firing.

Before firing, care should be taken to see that all oil is removed from the bore. If the bore is oily, smoke will be given off and disclose the position.

Under no circumstances should anyone be permitted to pass in front of, or near to the muzzle, whilst firing is in progress.

All working parts should be cleaned and oiled, the striker stud examined and, if necessary, tightened up. The mortar should be cleaned, all residue removed from the chamber and the bore slightly oiled.

After firing, the various nuts and screws on the mortar and stand should be examined to see that they have not shaken loose by the vibration due to firing.

Care should be taken that the hinge bolts and catch plates of the shield are kept free from dirt and rust.

DIMENSIONS AND WEIGHTS.

Description.	Dimensions (Approximate.)	Weight (Approximate).
Mortar (with traversing band)...	48-ins. × $3\frac{3}{4}$-ins.	48-lbs.
Stand (tubular) Mark II ...	34-ins. × $8\frac{1}{2}$-in. × $4\frac{1}{2}$-in. ...	34-lbs.
Base plate (Mark II)	15-ins. × 15-ins.	60-lbs.
(Mark III)	20-ins. × 13-ins.	40-lbs.
Shield, assembled	48-ins. × 72-ins.	270-lbs.
Box, Store, filled	57-ins. × $16\frac{1}{2}$-ins. × $11\frac{1}{2}$-ins.	196-lbs.
	Anti-Aircraft Equipment.	
Mortar	48-ins. × $3\frac{3}{4}$-ins.	44-lbs.
Mounting, Mark II	41-ins. × 21-ins.	10-lbs.
Base plate, Mark I	20-ins. × $13\frac{1}{2}$-ins. × 4-ins. ...	46-lbs.
Straps, transporting	—	1-lb.
Box, ammunition, B. 131 ...	21-ins × 12-ins. × 4-ins. ...	46-lbs. $13\frac{1}{2}$-ozs.

MISCELLANEOUS STORES.

Brush, Wire, M.L. 3-inch Stokes Trench Mortars.—The brush consists principally of a square steel spindle with cast iron front and rear flanges, a tubular rod with handle, and four wire-covered hard wood segments, which are curved at the front end to suit the interior of

the breech and are provided on their underside with retaining plates and flat steel springs. The free ends of the springs, operating on the spindle, permit of the contraction and expansion of the brush when in use.

The flanges are provided with perforations to receive the ends of the retaining plates and with sockets which engage shoulders on the ends of the spindle. The front and rear flanges are secured on the spindle by a locking screw and a hexagon nut with spring washer, respectively.

The rod is of tubular steel with a T-handle at one end and is attached to the spindle by a screwed socket with keep pin.

Dimensions.

Length, overall	52-inches.
Diameter of brush (expanded) ..	3·45-inches.

Box, Ammunition, M.L. 3-inch Stokes Trench Mortar, B. 131.

The box is made of wood and is fitted internally with a wood partition which is recessed to take the spigots of three bombs, and forms a recess for an inner box in which is carried the necessary fuzes, cartridges, &c., packed in tin boxes. The approximate dimensions of the inner box are 10-inches by 3-inches by $3\frac{1}{2}$-inches. Four splayed pieces are attached to the bottom of the box to steady the bombs during transit.

A certain number of boxes may be met with which differ from the above in having two cross pieces, shaped to take the bombs, instead of the wood partition.

Length overall	22-inches.
Breadth ,, ...	12 ,,
Depth ,, ...	6 ,,

The weights of the box, empty and filled, and also the contents are as follows :—

	lbs.	ozs.
Box, ammunition (empty)	13	0
Bombs, H.E. (3)	29	14
Box, inner (empty)	—	$9\frac{1}{2}$
Fuzes, No. 146 (3) (each in tin box) ..	2	10
Detonators, No. 1 (3) (in cardboard box)	—	4
Cartridges (3) and augmenting cartridges (12) } (in tin box)	—	8
Total (box filled)	46	$13\frac{1}{2}$

Box, Ammunition, M.L. 3-inch Stokes Trench Mortar, B. 153.

The box, which is made of wood, is furnished with rope handles and is divided into two compartments, one to receive the bombs and the other the cartridges, exploders and fuzes. The bombs are held in position in the bottom of the box by means of wood guides and a rack and are secured by means of a wood packing piece nailed to the underside of the lid.

Length overall	21·5-inches.
Breadth ,, ...	11·125-inches.
Depth ,, ...	5·5-inches.

Contents.

Bombs, H.E., light	3
Fuzes, No. 136, in tinned plate box	3
Exploders ,, ,, ...	3
Cartridges ,, ,, ...	3

The approximate weight of the box, filled, is $31\frac{1}{2}$-lbs.

Box, Store, M.L. 3-*inch Stokes Trench Mortars.*—The *Mark I* box is made of wood and is provided with rope handles secured by wood cleats. It is provided internally with wood fittings and a leather strap to carry the equipment (except shield) and various stores, also a small "Box, spare springs," as shown in Appendix I to A.F. G. 1098–243.

The lid is secured to the body by four screwed dowels which pass through holes in the lid and are then nutted up by hexagon nuts.

The *Mark II* differs from the *Mark I* in being fitted with wing nuts for securing the lid.

Box, tool, M.L. 3-*inch Stokes Trench Mortar.*—This is of wood and is fitted with a hinged lid provided with a hasp fastening. It is carried in the Box, Store, and is designed to hold the various tools for use with the equipment. For contents of this box see Appendix I to A.F. G. 1098–243.

Carrier, bomb, M.L. 3-*inch Stokes Trench Mortar.*—The carrier is of khaki canvas and is made up in the form of a sleeveless jacket with open sides and a circular hole in the centre through which the head of the ammunition number is passed. The back and front are sewn down the centre to form pockets to carry four bombs (one in each pocket) and four small pockets are provided at the bottom of the carrier to hold the cartridges.

Clinometer, M.L. 3·7-*inch and* 4-*inch and Stokes* 3-*inch Trench Mortars.*—The clinometer consists of a cast-iron body having a long flat bearing surface and a revolving circular disc, to which is attached a spirit bubble, which is sensitive to about 2-minutes.

The disc is graduated in single degrees and can be clamped to the body at any required reading.

In future, bubbles will be painted on the upper surface with black streaks outside the ordinary graduations and with radium compound on the underside to make them self-luminous for use at night. Instruments fitted with radium-painted bubbles will be marked with a red "R" for purposes of identification.

Clinometer, A.A. M.L. Stokes 3-*inch T.M. Mark I* (*Plate XI*).—The clinometer is of the pendulum type. The body is formed in a four-sided skeleton plate, which is practically square. A slide is secured to the underside of the body plate, which fits in a groove formed in a supporting band. A stop at the front end of the slide prevents the clinometer from slipping out of the groove when in use and a clamping screw on the supporting band is also provided for securing the clinometer. The supporting band which is shaped to fit over the barrel is secured to the elevating band of the mortar by two nuts.

An index plate and scale plate are attached to the body plate by securing screws. Four-yard scales are graduated on the scale plate to suit the various charges used with the mortar and the nature of charge to be used with each scale is marked against it.

A pendulum reader and pendulum stop with a stop stud and milled nut are hinged to the upper corner of the body plate and an index pointer, with a radius line throughout its length, works in a groove cut in the index plate, a guide screw with milled nut is provided for clamping the index pointer as required.

Cover, Muzzle, M.L. 3-inch Stokes Trench Mortar.—The *Mark II* muzzle cover is of leather, shaped to fit over the muzzle and is provided with a securing cord.

The *Mark I* muzzle covers are similar to the *Mark II*, but are made of canvas with wire ring and securing cord. No more *Mark I* covers will, however, be made and existing covers will be considered obsolete as they become unserviceable.

Implements, Ammunition—Extractor, Cartridge, M.L. 3-inch Stokes Trench Mortar.—The *Mark I* extractor consists of a steel rod, blackened in oil, 4·52-inches long and 1·22-inches in diameter; a semicircular hole with bevelled edges is provided at one end and a morticed slot at the other for removing cartridges from the container. A hole is drilled in the centre to receive a lanyard.

The *Mark II* differs from the *Mark I* in the semi-circular hole being prepared for use with cartridges fitted with a guard.

Implements Ammunition—Key No. 74, Mark I.—The key consists of a flat bar of steel, 6-inches long, with a semi-circular jaw at one end with two studs at right angles to the jaw to engage in the slots in the No. 136 fuze for fixing purposes. The handle is fitted with a lanyard.

Rod, cleaning, M.L. 3-inch Stokes Trench Mortars.—The rod is made of tubular steel, 49-inches long and about ⅞-inch in diameter. It is cut longitudinally at one end for about 6-inches to form four portions, which are splayed out and have their ends turned in so as to retain the cotton waste or rag when used for cleaning the mortar.

Spanner, combination, M.L. 3-inch Stokes Trench Mortar Equipment.—The spanner is of steel. It is provided with two pairs of jaws at one end, the other end being turned up to form a screwdriver; it has four hexagonal holes of various sizes formed in the body.

The spanner fits all the nuts and bolts of the stand and also fits the striker stud. The screwdriver end is for use with the trunnion studs.

Tommy, M.L. 3-inch Stokes Trench Mortar.—The tommy is of bar steel and is reduced at one end to suit the hole in existing breech pieces, the other end being arranged to suit the larger hole in the strengthened breech piece of future manufacture.

Wrenches, Stop Collar, M.L. 3-inch Stokes Trench Mortar "A" and "B."—The wrenches are of flat bar steel, one end being semicircular in shape and fitted with a stud to engage a hole provided in the clamping collar of the stop collar and the opening of the split ring respectively. The wrenches differ from each other in the diameter of the clutch portion.

AMMUNITION.

Bombs.				Nature of Fuze.	Cartridge.		Means of Firing.
Description.	Mark.	Weight.			Nature.	Weight.	
		Empty.	Filled and Fuzed.				
		lbs. ozs. drs.	lbs. ozs. drs.				
Bomb, M.L., H.E., 3-inch Stokes Trench Mortar	IV (*a*)	7 12 0 + 2 ozs. − 4 ozs.	10 11 8 (*b*)	Fuze, percussion, Spigot, No. 146, 147 or 148	Ballistite ... Cordite flake E.C. 3 powder	95 grains 110 grains (*c*) (*d*) 125 grains (*c*)	Percussion cap.
Bomb, M.L., H.E., with vanes, 3-inch Stokes Trench Mortar, light (*e*)	II	4 12 0 ± 3 ozs.	6 13 0(*b*) ± 3 ozs.	Fuze, percussion, No. 136			

(*a*) Other marks may be met with.
(*b*) Excluding cartridge.
(*c*) Alternative augmenting charges.
(*d*) Consisting of four rings, each of 110 grains.
(*e*) The cartridge for use with this bomb is not yet approved.

Bomb, M.L., H.E., 3-inch Stokes Trench Mortar (§).
(*Plate XII.*)
Typical.

The bomb consists of a steel or iron cylinder screwed at both ends, one end to receive a head formed with a projecting spigot in the centre, which is screwed to receive the fuze and the other end to receive a base fitted with a "Container, tubular, propelling charge." The container consists of a steel tube perforated with 16 holes.

Bomb, M.L., H.E., with Vanes, 3-inch Stokes Trench Mortar, Light, Mark II.
(*Plate XIII.*)

The *Mark II* bomb consists of a cast iron body, stream line in shape, which is threaded at the head to receive the "Plug, Fuze Hole, 1·375-inch" or a "Container, Exploder," No. 4, and at the base to receive the "Container, Propelling charge." The exterior of the body is formed with a guide ring at the shoulder and the interior is corrugated and varnished. The container, propelling charge is of tubular steel perforated with 16 holes to distribute the gas from the charge equally around the bomb; it is threaded at the front end to screw into the base of the body against a copper washer. The space within the container not occupied by the cartridge is filled by a wood plug driven in and the exterior is fitted with two pieces of sheet steel bent at right angles to form four vanes and brazed on to the rear end of the container.

The bombs are issued fitted with a "Plug, fuze hole, ·904-inch" and when required for use the plug is removed, an exploder inserted into the exploder container and a No. 136 fuze screwed into the head.

Cartridge, M.L., 3-inch Stokes Trench Mortar; 95 Grains Ballistite (§).
(*Plate XIV.*)
Typical.

The cartridge consists of a cylindrical paper case with a brass base fitted with a brass cap chamber and filled with a charge of ballistite. The top of the case is closed by two cardboard discs and two felt wads. The base is fitted with a striking arrangement outside the cap which consists of a steel guard, striker disc and a steel striker. The steel guard is cup-shaped and is sprung on to the edge of the base. The striker disc is secured to the guard by four nicks and has riveted to it the steel striker, which it holds in position below the cap.

Cartridge, M.L., 3-inch Stokes Trench Mortar, Augmenting, 110 Grains Cordite ·3mm. Flake, Mark I (§).
(*Plate XV.*)

Augmenting charges, each consisting of 110 grains of cordite flake contained in a blue cambric bag, are also issued, the full charge for the mortar consisting of the cartridge and four of these augmenting charges. In order to fit the charges on to the container at the base of the bomb, each charge is bent round in the form of a ring, the ends being secured by elastic.

(§) For method of packing, *see* description of "Box, ammunition," on page 10.

Cartridge, M.L., 3-inch Stokes Trench Mortar, Augmenting, 125 Grains, E.C. 3 Powder, Mark I (§).
(*Plate XVI.*)

This augmenting charge, which is alternative to that described on page 14, consists of 125 grains of E.C. 3 powder enclosed in a ring-shaped cover of celluloid reinforced with book muslin; to enable the ring to grip the container, the ends of the cover are connected by an elastic band secured with thread.

Fuze, Percussion, No. 136, Mark I.
(*Plate XVII.*)

The fuze consists of the following parts:—Body, detonator holder, detent and locking collars, needle, striker spring, impact cap, closing plug, bush, detent spring, arming spring, needle holder and detonator. All parts are of brass except the detent spring, arming spring and needle which are of phosphor bronze, and the striker spring which is of steel.

The *body* is screw threaded at its lower end to the ·9-inch gauge below which it is reduced in diameter and turned plain; its upper end is formed with a conical flange terminating a cylindrical stem. Slots are cut in the flange to take the Key No. 74 for fixing purposes. Internally the body is bored out in two different diameters to take the percussion arrangements; a diaphragm is formed near the centre which serves as a bearing for the striker spring and the top of the detent collar; a small hole bored through the centre of the diaphragm serves as a guide for the needle. The body is threaded internally at the top to take the bush and at the bottom for the closing plug.

The *detonator holder* consists of a brass tube formed with a flange near the centre which acts as a seating for the detent spring and the arming spring. Two grooves are turned around the upper portion of the holder to receive the projections of the detent collar in the normal or armed position respectively, and a recess is formed at the bottom to take a 1·7 grain detonator spun in.

The *detent collar* is flanged at the top to form a bearing for the top of the locking collar; the lower portion has six projections which grip in the upper grooves of the detonator holder when in the normal position.

The *locking collar*, which fits around the detonator holder, is formed internally with a shoulder which acts as a bearing for the detent spring and locks the projections on the detent collar in the upper or lower grooves of the detonator holder.

The bottom of the fuze is closed by the *closing plug;* the plug forms a seating for the *arming spring* which is fully compressed until after firing.

The *needle holder* is inserted in the top of the fuze and secured by means of the bush; it is supported by the striker spring and recessed through the centre to take the needle which is riveted in.

The *impact cap* is sprung into the needle holder.

The fuze requires no preparation before loading.

(§) For method of packing, *see* description of "Box, ammunition," on page 10.

Action.—On the shock of discharge the detent collar and locking collar set back, compressing the detent spring; the projections on the former ride over the shoulder between the grooves on the detonator holder and grip into the bottom groove; the detent spring then reasserts itself, and forces the locking collar upwards, thus holding the projections in the bottom groove and locking together the detonator holder, detent collar and locking collar. Owing to the change in position of the detent collar, the detonator holder is now free to be lifted by the arming spring until it fouls the diaphragm in the body, thus bringing the detonator nearer to the needle; the fuze is then armed. On impact, the needle holder is driven in, carrying the needle on to the detonator, the flash from which detonates the exploder and the bursting charge of the bomb.

Fuze, Percussion, Spigot, No. 146, Mark V (§).

(*Plate XVIII.*)

The fuze consists of the following principal parts:—Body of cast iron or mild steel, brass detonator holder with steel creep springs, aluminium needle holder, steel or lead and antimony ball, steel or zinc alloy cap, steel bracket, brass mud shutter, releasing tape and retaining pin, steel ejector spring and safety bar.

The *body* is bored out internally and screwed at the bottom to suit the spigot of the bomb, the top portion of the cavity containing the detonator and needle holders and the steel or alloy ball, the fuze being closed with the cap.

The top of the *detonator holder* is recessed to receive a 1·7 grain detonator, the bottom to form a magazine containing about 5 grains of F.G. powder.

The *detonator and needle holders* are kept apart by two creep springs fixed to the detonator holder so that the upper end of the detonator holder, which has a coned recess formed in the top, engages with the steel ball which in turn engages in a coned recess in the under surface of the cap.

A cylindrical metal *mud shutter* and a bracket with catch hooks are secured to the exterior of the fuze by the safety bar which passes through holes in the bracket, shutter and body of the fuze, the bar thus serves to keep the holders apart during transport and shock of discharge.

An *ejector spring* is placed between the brackets and the mud shutter.

A double twill cloth *tape* is attached to the safety bar; its free end is fitted with a tape spring and a retaining pin which engages in a hole and catch hooks in the bracket.

A *safety pin* passes through the retaining pin and prevents it from being jarred out of the catch hooks during transport. ~~The safety pin is removed just prior to loading.~~

Action.—On the shock of discharge the retaining pin sets back out of the catch hooks, thus releasing the tape. As the bomb travels

(§) For method of packing, *see* description of "Box ammunition" on page 10.

Action.—On the shock of discharge the detent collar and locking collar set back, compressing the detent spring; the projections on the former ride over the shoulder between the grooves on the detonator holder and grip into the bottom groove; the detent spring then reasserts itself, and forces the locking collar upwards, thus holding the projections in the bottom groove and locking together the detonator holder, detent collar and locking collar. Owing to the change in position of the detent collar, the detonator holder is now free to be lifted by the arming spring until it fouls the diaphragm in the body, thus bringing the detonator nearer to the needle; the fuze is then armed. On impact, the needle holder is driven in, carrying the needle on to the detonator, the flash from which detonates the exploder and the bursting charge of the bomb.

FUZE, PERCUSSION, SPIGOT, No. 146, MARK V (§).
(*Plate XVIII.*)

The fuze consists of the following principal parts:—Body of cast iron or mild steel, brass detonator holder with steel creep springs, aluminium needle holder, steel or lead and antimony ball, steel or zinc alloy cap, steel bracket, brass mud shutter, releasing tape and retaining pin, steel ejector spring and safety bar.

The *body* is bored out internally and screwed at the bottom to suit the spigot of the bomb, the top portion of the cavity containing

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W.O.
7944

Addendum (No. 1) to the Handbook

OF THE

M.L. Stokes 3-inch Trench Mortar Equipments.

LAND SERVICE, 1919.

Page 16:—

Description of "Fuze, percussion, Spigot, No. 146, Mark V"—

For 3rd line of text from bottom of page:

Read "The safety pin is removed just prior to loading, care being taken that the direction of the pull is at right angles to the axis of the bomb and never in a downward direction."

(B 15359z) Wt. 34274—4849 5M 3/21 H & S Ltd. G.H.67

through the air the tape is pulled off by air pressure and the pull of its spring, and assisted by the ejector spring, carries the safety bar with it, the bracket, which is then released, falling away.

The detonator and needle holders are now only held apart by the creep springs, so that if the fuze strikes the ground in a vertical position, the pellet which happens to be uppermost moves down, overcoming the creep springs, and the detonator is pierced by the needle. If the fuze falls on its side the steel ball rides on the coned surfaces in the cap and needle holder and forces the needle on to the detonator. The powder in the bottom recess of the detonator holder transmits the flash to the bursting charge of the bomb.

FUZE, PERCUSSION, SPIGOT, No. 147, MARK I (§).
(*Plate XIX.*)

The fuze consists of a tinned cast iron body, cap, needle holder, detonator holder, magazine, setback sleeve, mud shutter, creep spring, safety pin and spring clip and safety spring.

The *body* is bored out from the top to receive the magazine and percussion arrangements and screwed at the top to receive the cap. It is screwed at the base to fit a spigot or adapter. In the case of No. 146 fuze bodies being utilized for this fuze the safety bar hole is tapped and plugged with a screw plug, the markings on the cap are obliterated and the cap painted yellow and re-marked with the 147 fuze particulars.

The *needle holder* is tapered off at the top to engage in a cone shaped recess formed in the underside of the cap and is turned below a flange to fit into a deep annular recess in the top of the detonator holder. The needle is screwed in from the underside and projects below the base and into a hole bored through the centre of the detonator holder; a creep spring in the annular recess of the latter prevents the needle pellet from moving on to the detonator during flight.

The bottom of the *detonator holder* contains a 1·7 grain detonator and is rounded to engage in a corresponding recess in the top face of the magazine; two vent holes are bored through the side and into the central hole and annular recess to prevent air cushioning.

The *magazine* which is hollowed out on the underside to contain about 5 grains of F.G. powder, has seven flash holes bored through it to convey the flash from the detonator.

The *safety* arrangement consists of the following:—A steel band *safety spring*, corrugated at one end, is wound (commencing with the corrugated end) round the side of the needle holder and retained in position between the top face of the detonator holder and the flange of the needle holder, by a brass set back sleeve; the sleeve is held in position by two tongues which fit on top of the safety spring.

A *safety pin*, carrying a horse shoe shaped steel band spring which grips around the exterior of the fuze body, is passed through the side of the fuze under the lower edge of the mud shutter and set back sleeve and through the side of the detonator pellet.

The safety pin is removed at the moment of loading.

(§) For method of packing, *see* description of "Box ammunition" on page 10.

Action.—The shock of discharge causes the mud shutter to move backwards and cover the safety pin hole in the fuze body to prevent the ingress of mud. The set back sleeve also moves backwards and releases the safety spring, the latter, however, is prevented from opening out whilst the bomb is under acceleration in the bore due to the grip of the needle holder which sets back slightly. On acceleration decreasing after the bomb has left the bore, the creep spring re-asserts itself and lifts the needle holder, thus releasing the safety spring which opens out, leaving the detonator and needle holders held apart only by the creep spring. On impact, the detonator holder or needle holder, according to whether the bomb falls on the head or the base, moves forward and fires the detonator. If the bomb falls on its side the needle holder rides on the coned surface in the cap and forces the needle on to the detonator, the flash of which ignites the powder in the magazine.

FUZE, PERCUSSION, SPIGOT, No. 148, MARK I (§).

(*Plate XX.*)

This fuze is generally similar to the fuze, percussion, No. 146, differing only in having a shutter arrangement for releasing the safety bar in flight in place of a tape and spring.

The shutter arrangement consists of a brass shutter frame, shutter, and shutter cover. The shutter frame, which contains the shutter, is riveted to the mud shutter; two holes are bored in the frame, the one at the top to take a hinge pin for the shutter and shutter cover and one at the bottom to take a safety pin.

The *shutter* is a flat strip of brass formed at its upper end with two elongated projections; slots are formed in the projections to take the hinge pin and to allow the shutter a slight vertical movement in the frame; two arms, formed at the bottom of the shutter, fit into recesses in the frame and cover.

The *shutter cover* is hinged at the top to the hinge pin; two recesses are formed at its lower end to take the arms of the shutter, and a hole is bored through to take the safety pin.

The *safety pin* is removed at the moment of loading.

Action of Shutter.—In the normal position, the ejector spring is held fully compressed between the outer end of the safety bar, to which it is fixed and the mud shutter. The safety bar is kept in position by the shutter, which in turn is held by the arms fitting in the recesses in the frame and cover and is secured by the safety pin. On removing the safety pin, the shutter is kept up only by the friction caused through the pressure of the safety bar. On the shock of discharge it sets back and is released through the arms being withdrawn from their recesses; the pressure of the ejector spring, acting through the safety bar, causes the shutter and cover to revolve upwards and the safety bar to be withdrawn from the body. The fuze is then armed and on impact, the action is the same as that described for the No. 146 fuze on page 16.

(§) For method of packing, *see* description of "Box ammunition" on page 10.

PLATE I.

FIG. 3.

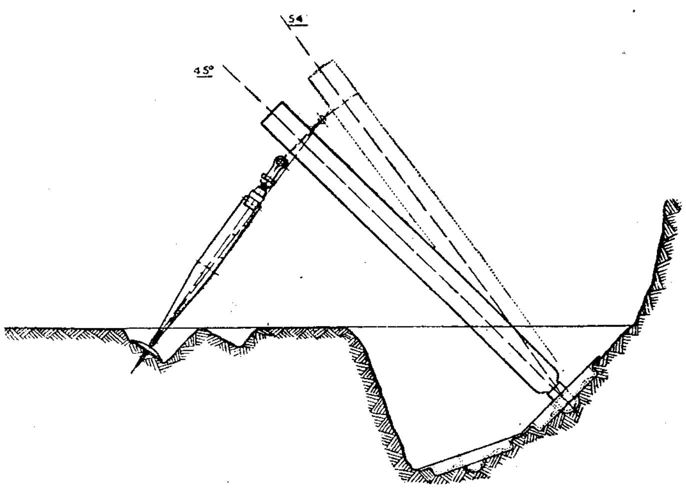
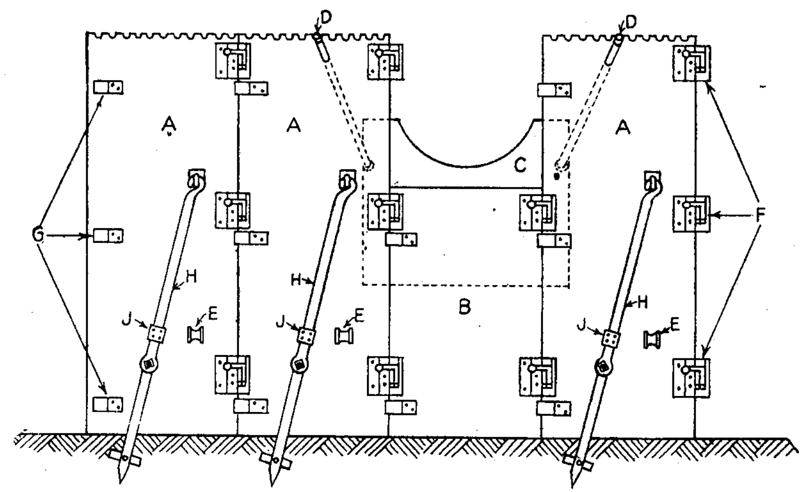


PLATE VI.

SHIELD, M.L., 3-IN. TRENCH MORTARS.



A—Shield, wing portion.

B—Shield, centre portion.

C—Shield, movable portion.

D—Hook, supporting,

E—Clip, supporting stay.

F—Hinge plate, with bolt.

G—Catch plate, hinge bolt.

H—Stay, supporting shield.

J—Loop, locking stay.

DIAGRAMS SHOWING METHOD OF MANIPULATING STAND AND BASE PLATE IN ORDER TO VARY ELEVATION.

Fig. 1.

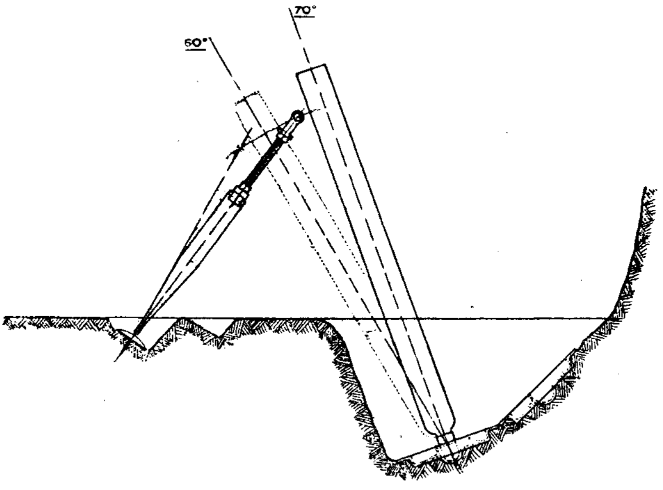
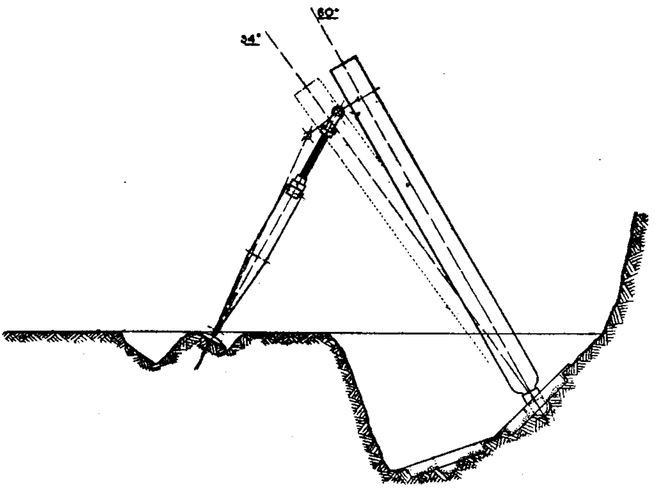


Fig. 2.



Stand, Mark II.

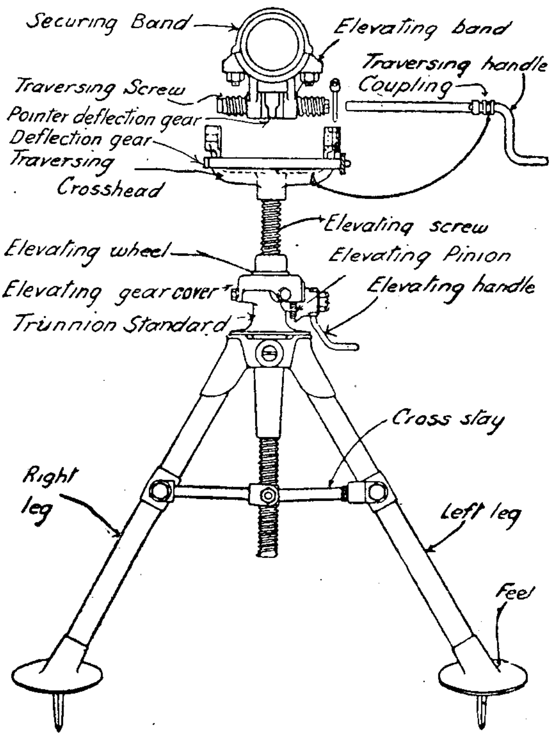
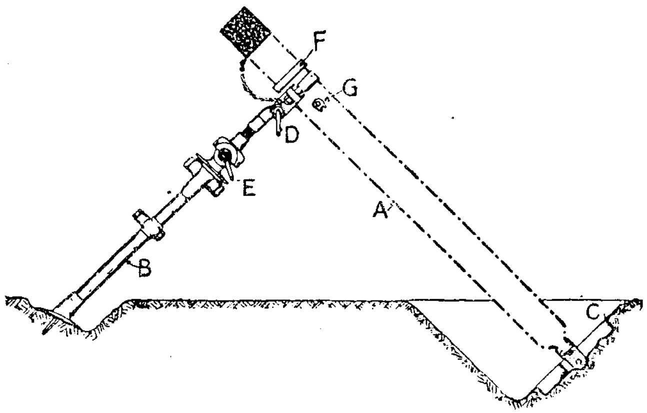


PLATE III.

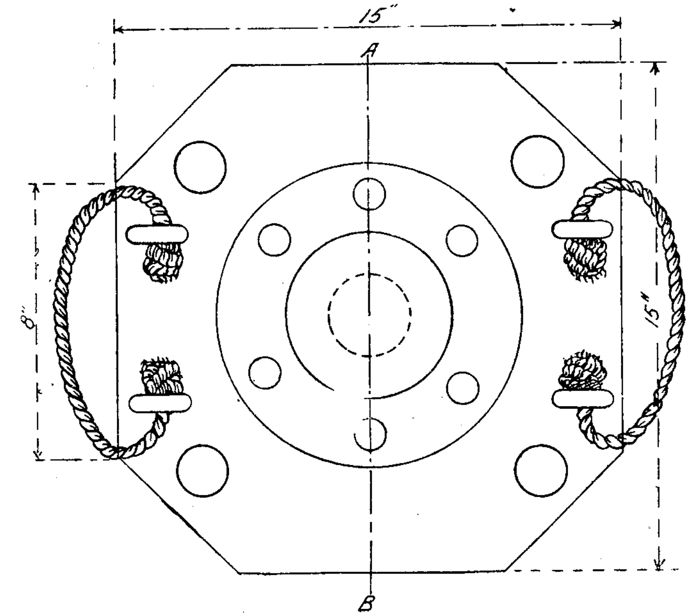
STOKES TRENCH MORTAR FITTED WITH MARK II STAND.



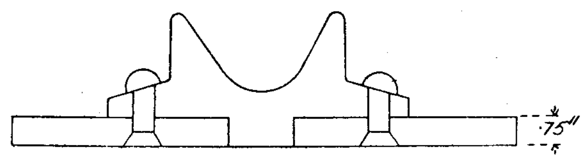
A—Barrel.
B—Tubular Supporting Legs.
C—Base Plate, Mark I.
D—Traversing Gear.
E—Elevating Gear.
F—Stop Collar.
G—Stop Bolt.

PLATE IV.

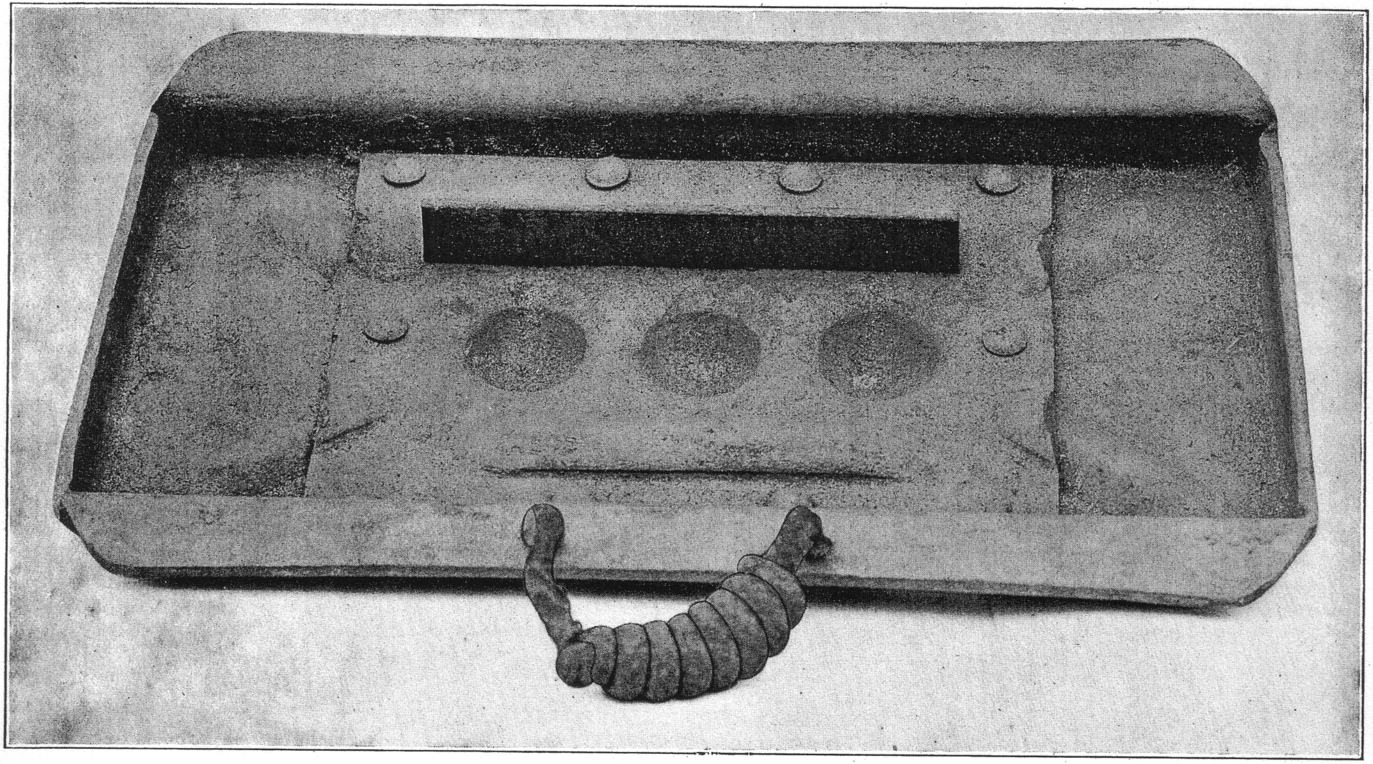
BASE PLATE, STOKES TRENCH MORTAR, MARK II.



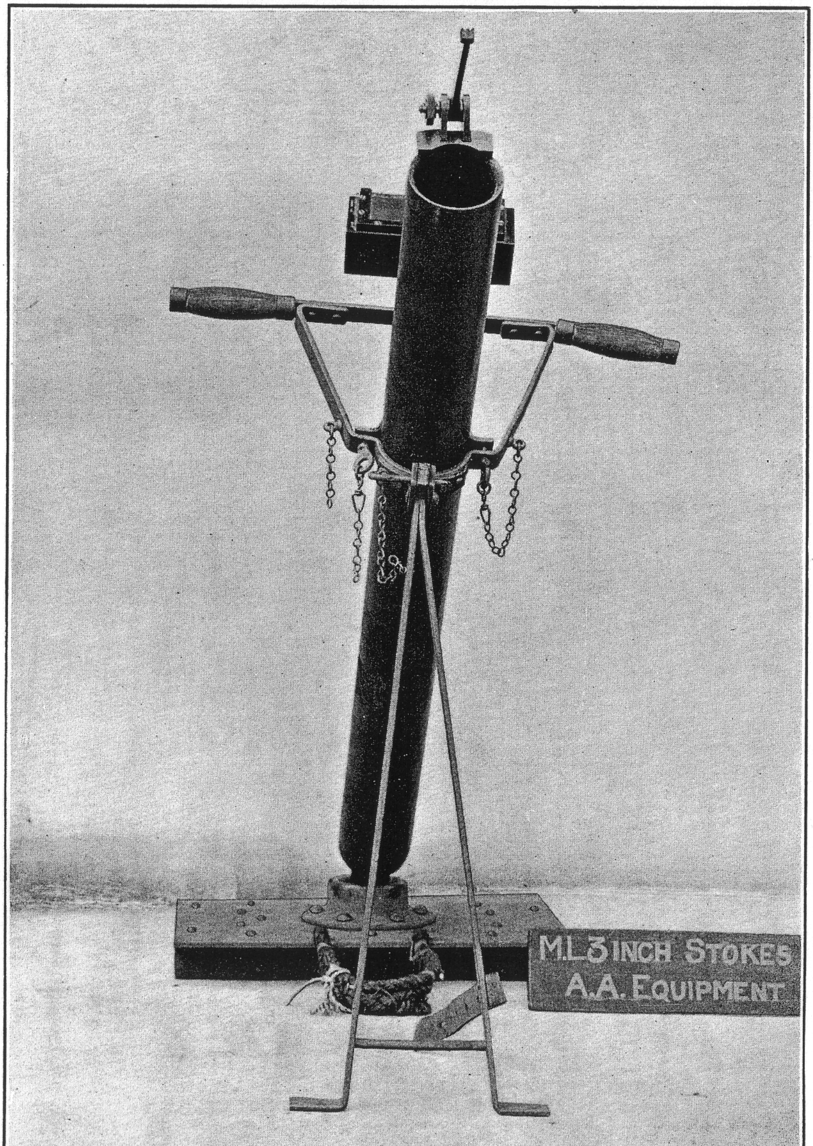
SECTION ON A.B.



PLATE, BASE, M.L. STOKES 3-INCH TRENCH MORTAR, MARK III.



Mounting, Anti-Aircraft, M.L. Stokes 3-inch Trench Mortar.



Mounting, Anti-Aircraft, M.L. Stokes 3-inch Trench Mortar.



Mounting, Anti-Aircraft, M.L. Stokes 3 inch Trench Mortars.

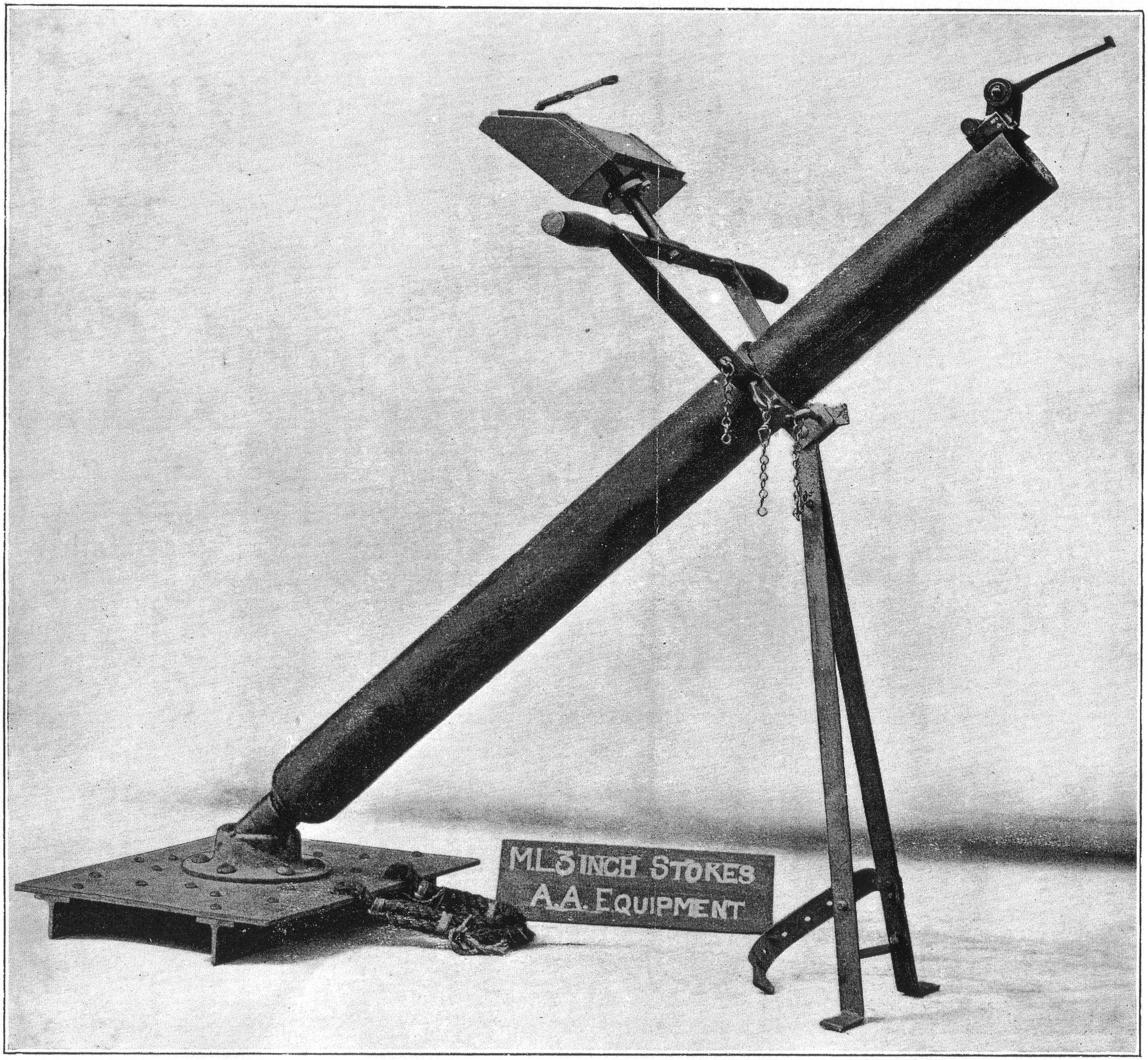


PLATE X.

STRAP, TRANSPORTING, M.L. STOKES 3-INCH TRENCH MORTAR.
(For anti-aircraft equipments.)

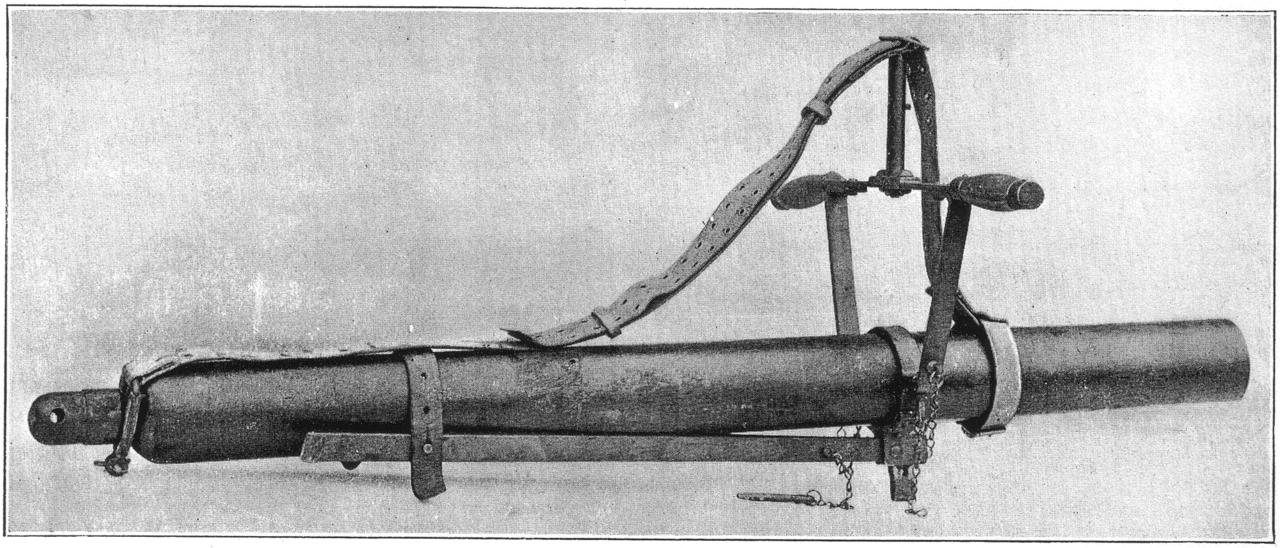
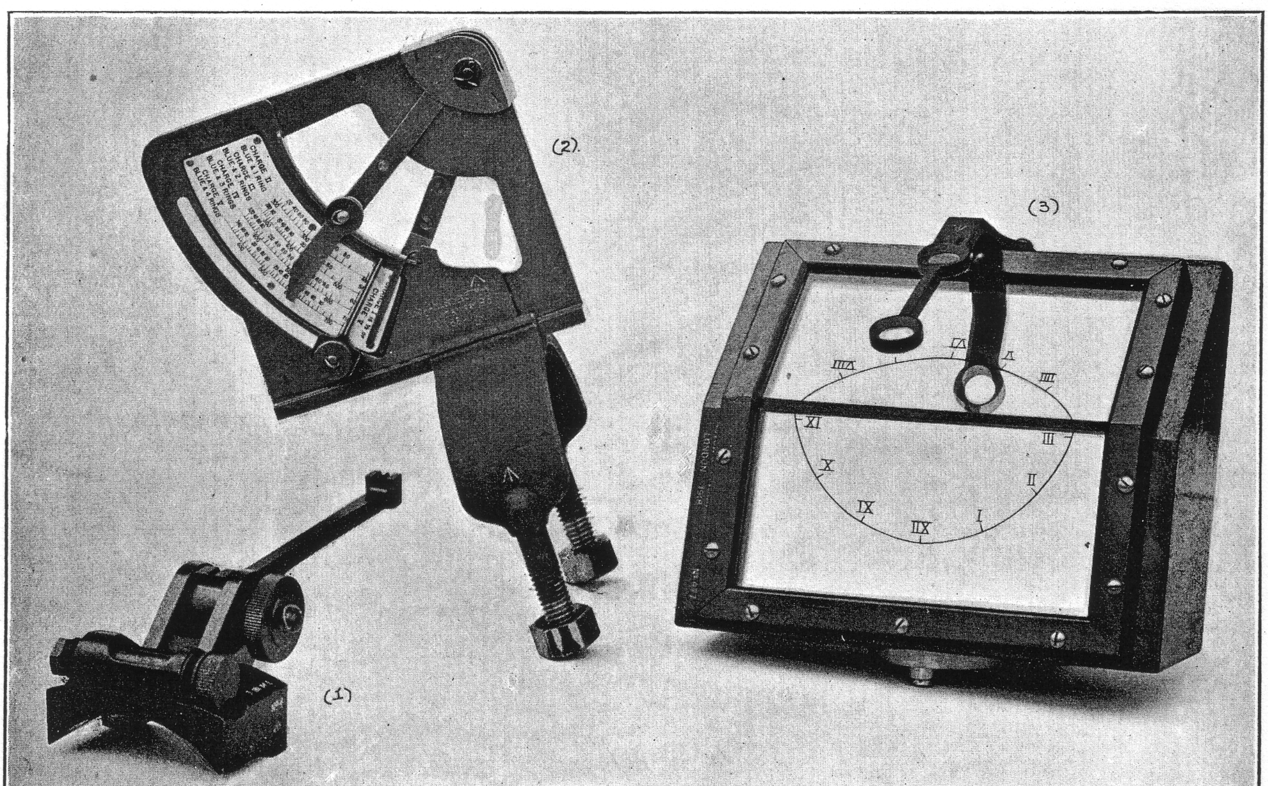


PLATE XI.

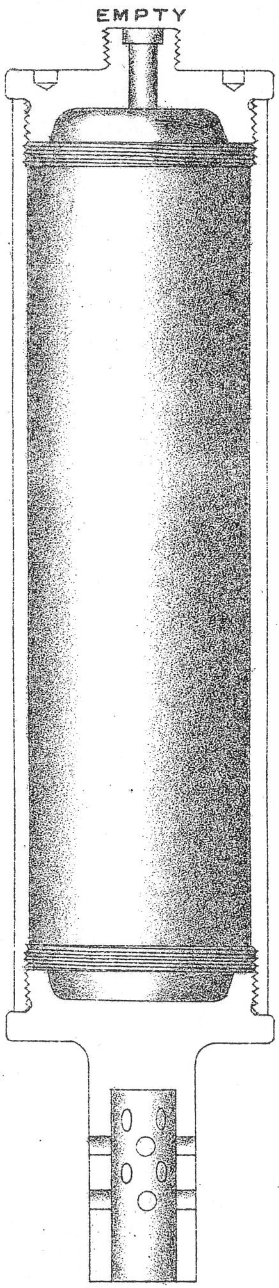
SIGHTING, M.L. STOKES 3-INCH TRENCH MORTAR.

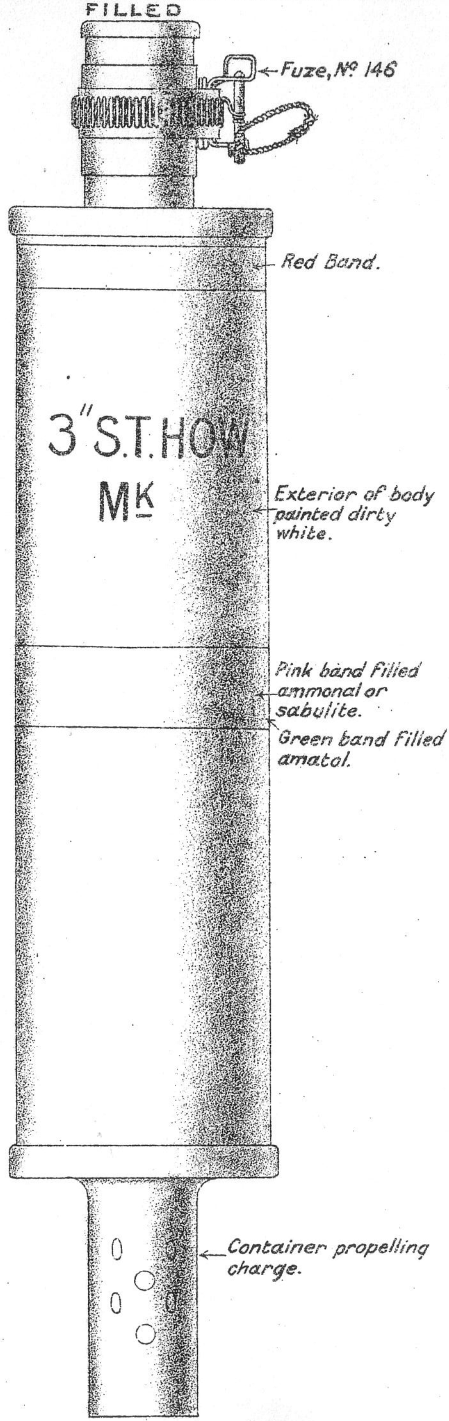


BOMB, M. L. H. E. 3-INCH STOKES TRENCH MORTAR.

SCALE 1/2.

TYPICAL.



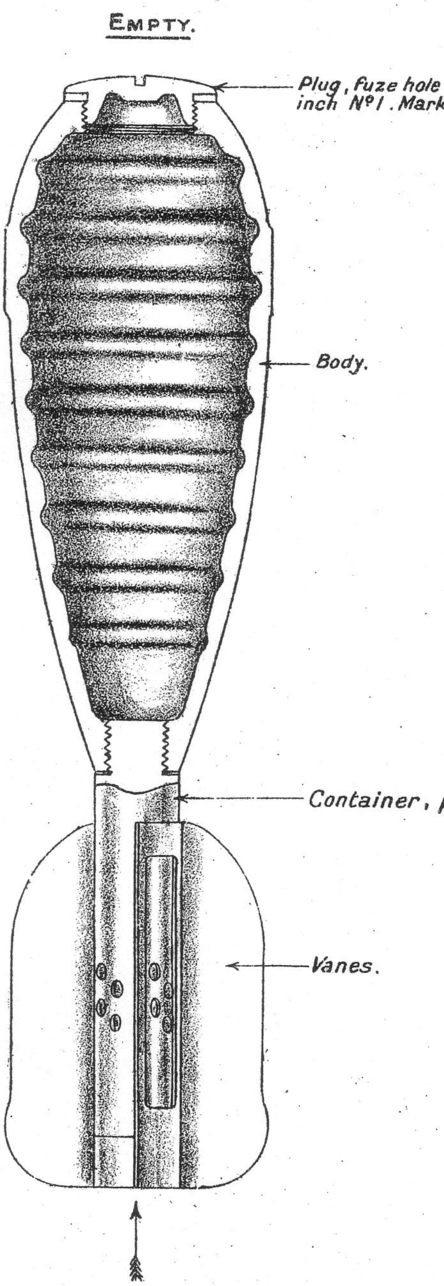


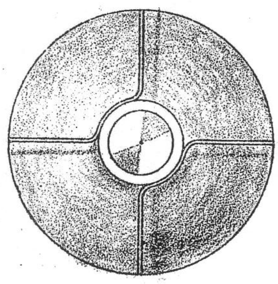
2092. 10.18. WT W5931

H. & C. GRAHAM LTD LITHRS LONDON

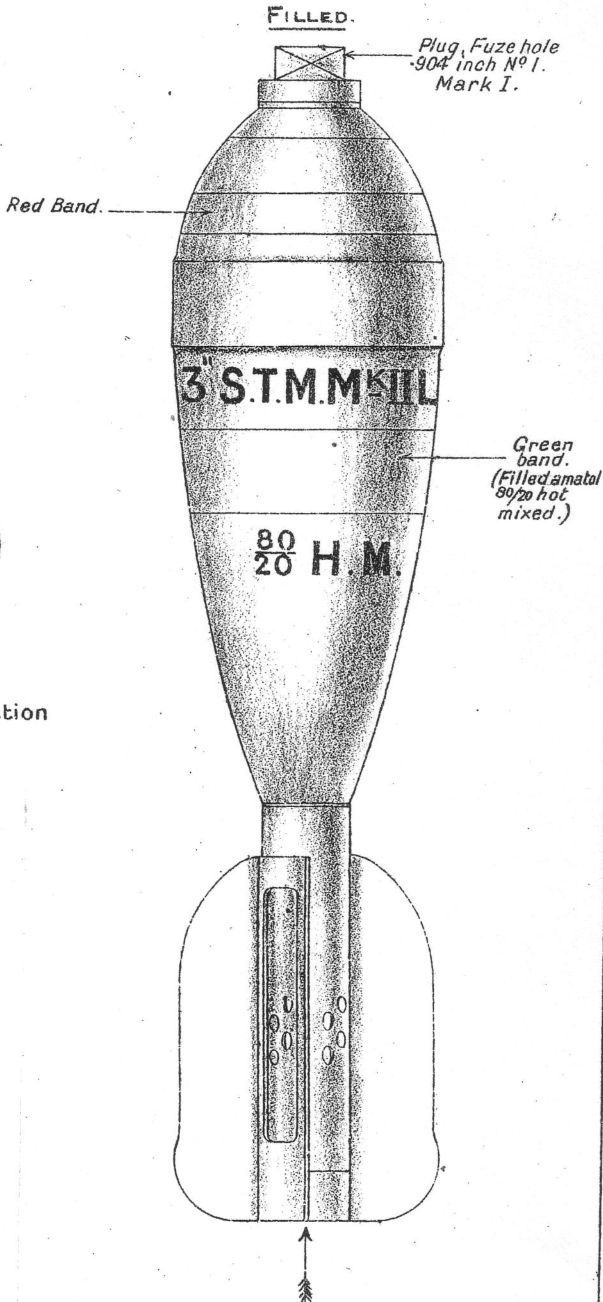
BOMB, M.L., H.E., WITH VANES, 3 INCH STOKES TRENCH MORTAR, LIGHT, MARK II.

Scale ½.





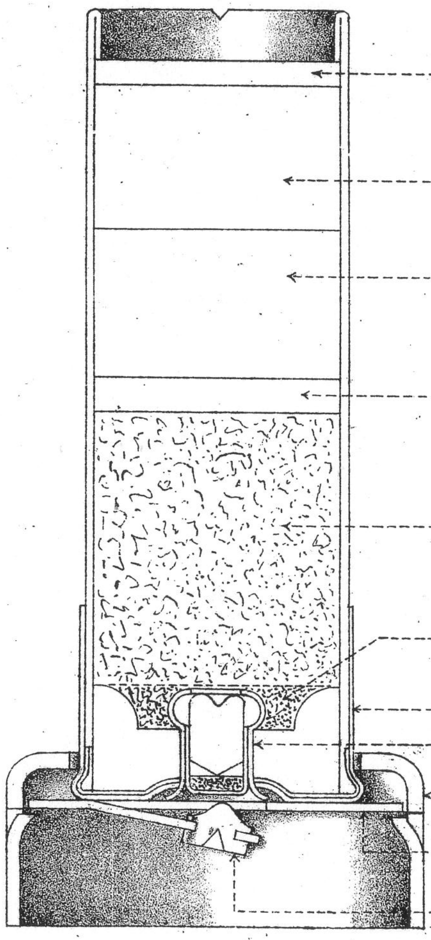
View Looking in direction of Arrow



CARTRIDGE, M.L.3-INCH STOKES TRENCH MORTAR, 95-GRAINS BALLISTITE.

SCALE 2/1

TYPICAL.



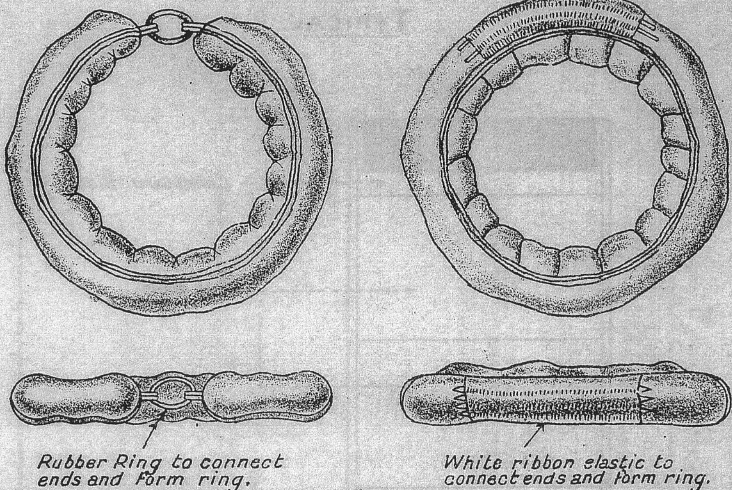
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H. & C. GRAHAM LTD LITHRS LONDON.

Cartridge, M.L., 3 inch Stoke's Trench Mortar, Augmenting, 110-grains Cordite · 3 m/m. Flake, Mark. I.

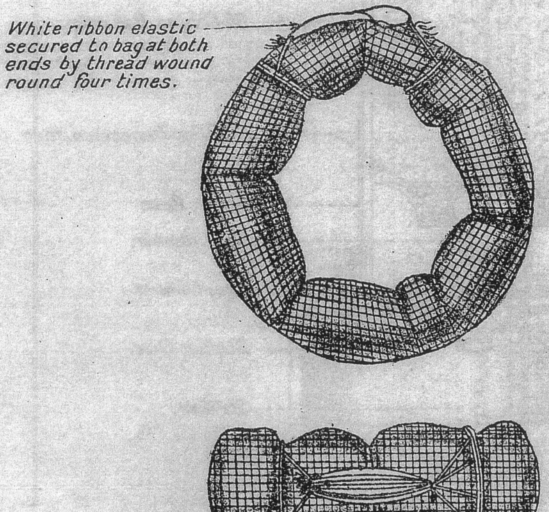
Scale = 1/1.

Alternative Cartridges.



Cartridge, M.L., 3 inch Stoke's Trench Mortar, Augmenting, 125-grains, E.C.3. Powder, Mark I.

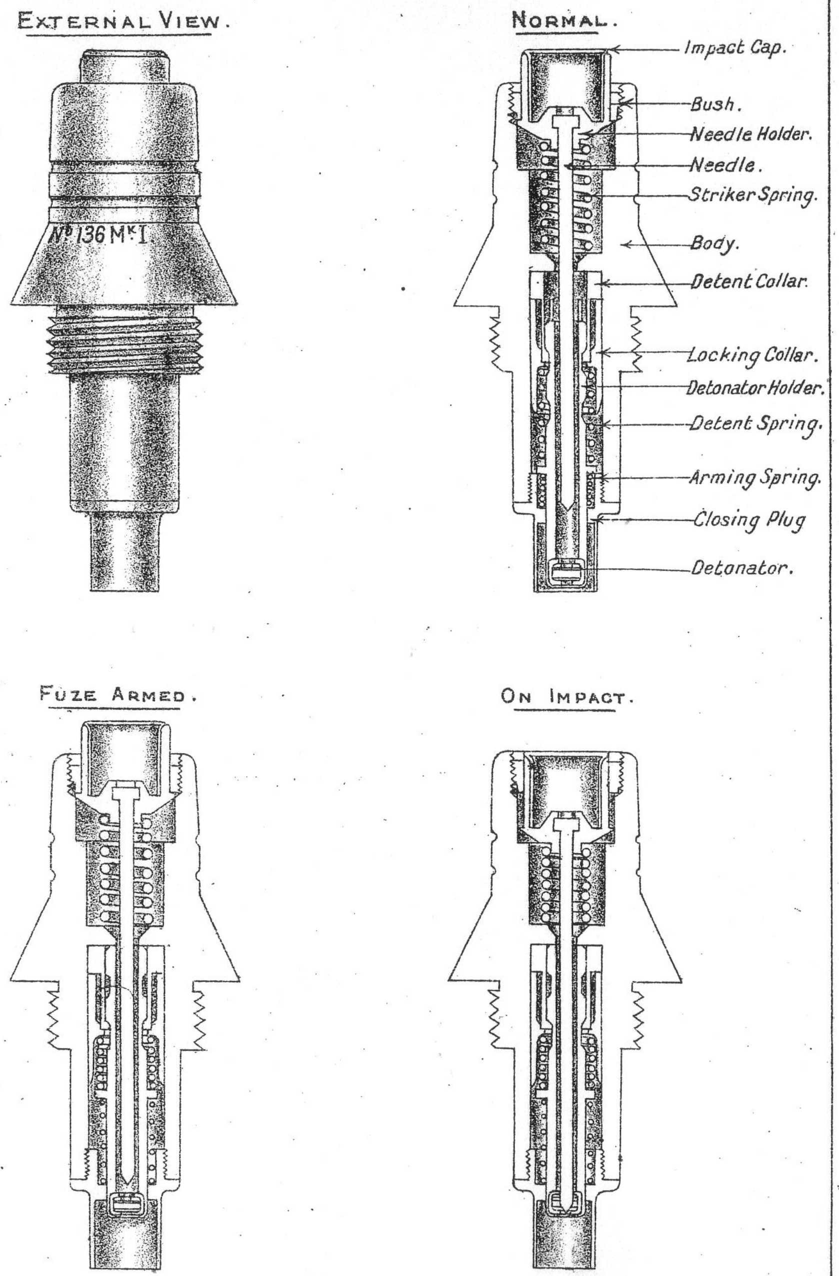
Scale 1/1.



H. & C. Graham Ltd Lith^rs London, S.E.

FUZE, PERCUSSION, No 136, MARK I.

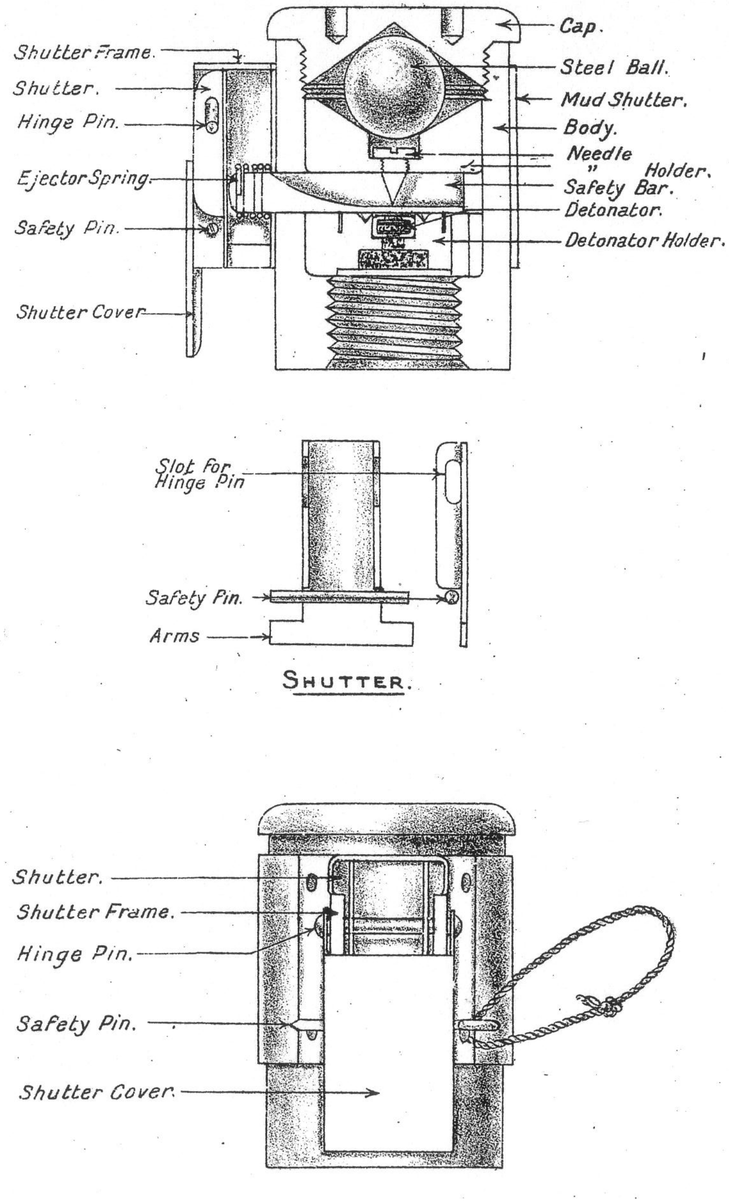
Scale Full Size.



2092. H. & C. GRAHAM LTD LITHRS LONDON. S.E.

FUZE, PERCUSSION, SPIGOT, No 148. MARK I.

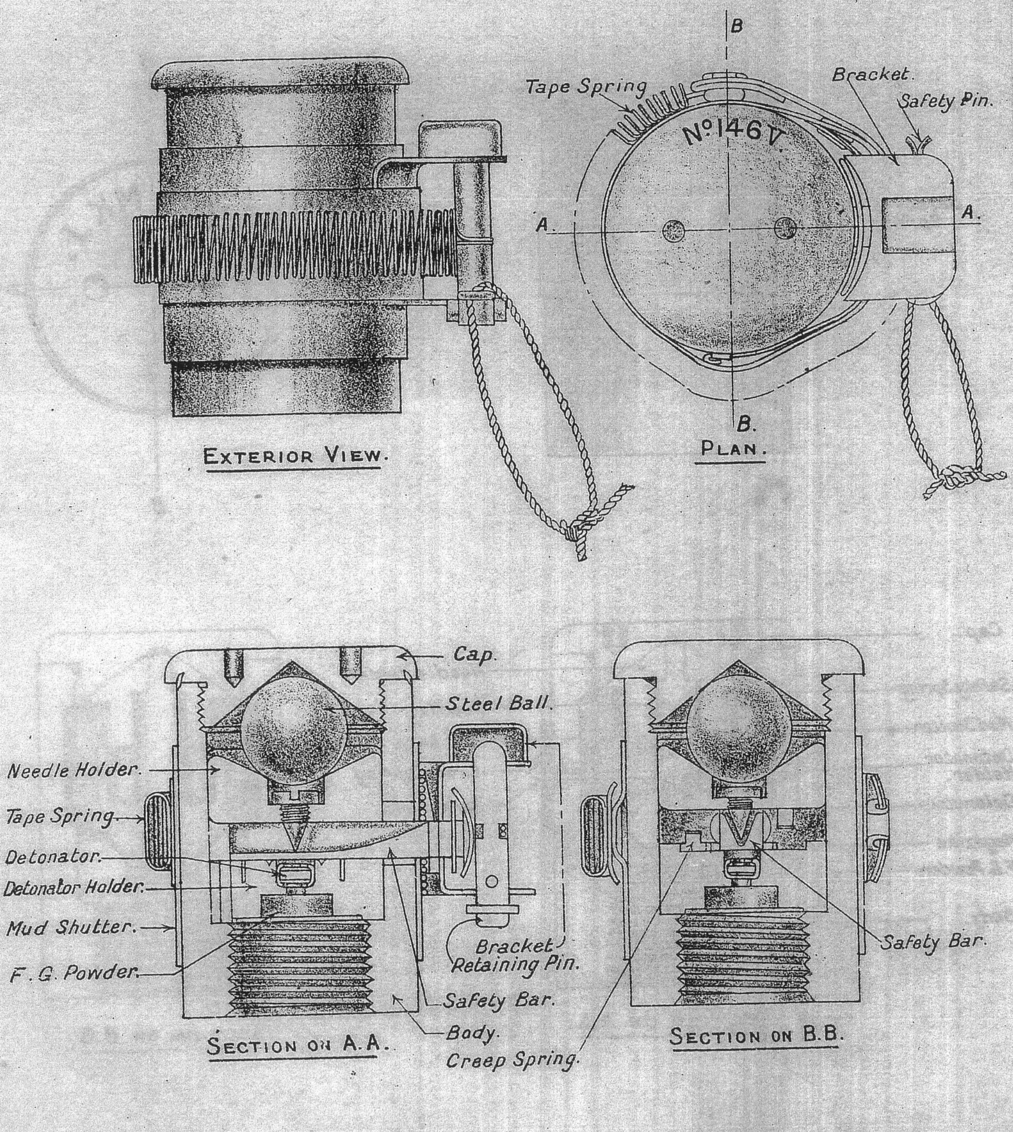
Full Size.



2092. H. & C. GRAHAM LTD LITHRS LONDON. S.E.

FUZE, PERCUSSION, SPIGOT, Nº 146, MARK V.

Full Size.



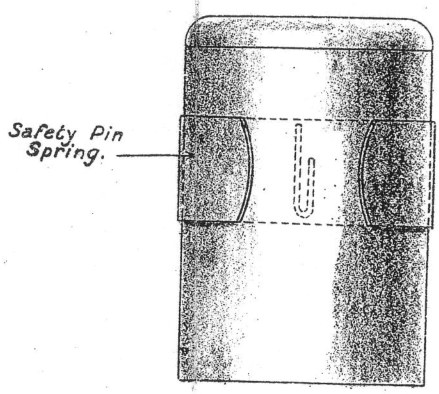
EXTERIOR VIEW. PLAN.

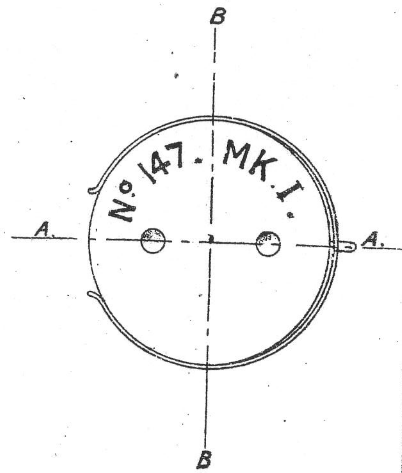
SECTION ON A.A. SECTION ON B.B.

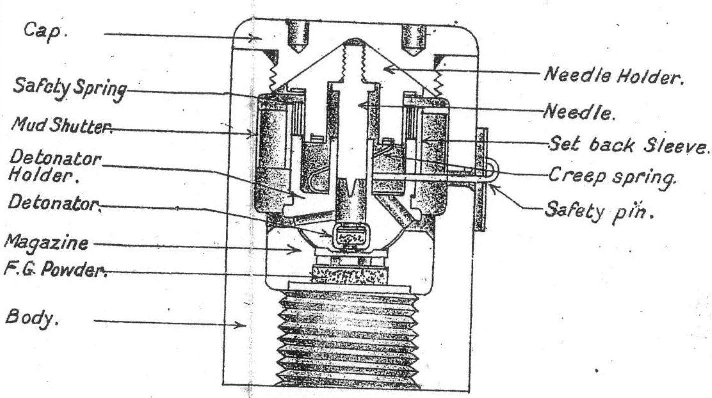
H. & C. GRAHAM LTD LITHRS LONDON, S.E.

Fuze, Percussion, Spigot, No. 147. Mark I.

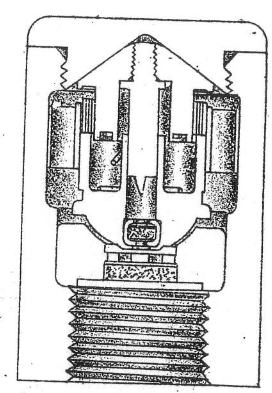
Full Size.







Section on A.A.



Section on B.B.

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